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A Reconnaissance Survey Of Unnamed Lake (Lake 8731)

M. J. Hunter
March 1997

PWFWCP Report No. 154

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave.
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Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

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Prince George, B.C. V2L 3H9

105-02096/

A RECONNAISSANCE SURVEY OF

UNNAMED LAKE (LAKE 8731)

WATERSHED:	**Finlay River**
DATE OF SURVEY:	**August 11, 1996**
FIELD CREW LEADER:	**Mark Hunter**
FIELD ASSISTANT:	**Karin Mathias**
REPORT PREPARED BY:	**Mark Hunter**

BRITISH COLUMBIA CONSERVATION FOUNDATION

PEACE / WILLISTON FISH AND WILDLIFE COMPENSATION PROGRAM

B. C. MINISTRY OF ENVIRONMENT, LANDS AND PARKS

FUNDED BY: FOREST RENEWAL BRITISH COLUMBIA

RELEASED BY: _____

D. J. Cadden, Regional Fisheries Biologist

LAKE: Unnamed Lake (Lake 8731) **SYSTEM NAME: Finlay River**

A.S.A.P. REFERENCE NO.: **WATERSHED CODE: 239-1599-576**

DATA ON FILE FOR THIS SURVEY

Location	X	Dissolved 02 / Temp. Profiles	X
Physical Data	X	Winter Dissolved 02 / Temp. Profiles	--
Bench Mark	X	Netting Record	X
Terrain Features	X	Lake Catch Summary	X
Access	X	Individual Fish Data	--
Resorts and Campsites	X	Fish Preserved	--
Other Developments	X	Stomach Analysis	--
Obstructions and Pollutions	X	Scale Reading	--
Special Restrictions	X	Location of Inventory Sites	X
Aquatic Plants	X	Photograph Directory	X
Wildlife Observations	X	Appendices	
Miscellaneous Comments	X	A: Water Chemistry Analysis	X
Lake Drainage	X	B: Tributary Stream Data	X
Fisheries Management Comments	X	C: Fish Scale Analysis	--
History of Previous Surveys	X	Bathymetric Map Reduction	X
Water Chemistry Summary	X	Bathymetric Map	--

LOCATION

Location:	approximately 27 km east-southeast of Fort Ware		
Elevation:	1150 m ± 10 m	U.T.M.:	10.368377.6359879
Latitude / Longitude:	57°21'46" 125'11'18"	N.T.S. Map No.:	94 - F / 6
Management Unit:	7-41	Biogeoclimatic Zone:	Spruce - Willow - Birch
Ecoprovince:	Northern Boreal Mountains	Ecoregion:	Northern Canadian Rocky Mountains
Ecosection:	Western Muskwa Ranges		

Drainage: Unnamed C. --> Del C. --> Finlay R. --> Williston Reservoir (Finlay Reach) --> Peace R.

PHYSICAL DATA

Lake Drainage Area:	1.7 km^2	Volume:	293 691 m^3
Water Surface Area:	50 820 m^2	Perimeter of Islands:	0 m
Area Above 6 m Contour:	29 548 m^2	Number of Islands:	0
Shoreline Perimeter:	1927 m	Mean Depth:	5.8 m
Maximum Depth:	18.6 m	Secchi Reading:	9.95 m
Filterable Residue (TDS):	200 mg/L		

Sounding Device: Lowrance X-15 Elevation Source: Contour Interpolation

BENCHMARK

(Iron spike, center of red circle) located 2.0 m above present water level in a 21 cm diameter spruce tree that is 1.8 m from the present water's edge and located on the northeast shore of the lake approximately 350 m from the outlet (Plate # 5).

High Water Mark: 0.20 m above water level at time of survey

94-F/6
U S K W A R A N
R I V E R
(R O C K Y
M O U N T A I N
~21km to
Fort Ware
(M O N T A G N E S
R O C H E

LAKE: Unnamed Lake (Lake 8731)

TERRAIN FEATURES

Immediate Shoreline:

The east and west sides of Lake 8731 are fronted by a narrow growth of sedge grasses with spruce trees, fir trees and Labrador tea growing behind on slopes that change from moderately steep to steep as the shoreline progresses northwards. There are some bedrock outcroppings along the northeast and northwest sides of the lake. The north end of the lake is fronted by sedge grasses with Labrador tea and some spruce trees growing behind on a low slope. A sedge grass marsh is located on the south end of the lake. The lake's substrate on all sides is composed of silts and organics with some woody debris mainly along the east and west sides of Lake 8731. The north and south ends of the lake are very shallow. From the shoreline, there is a steep slope towards the center of the lake along the east and west sides of the lake.

Surrounding Country:

Lake 8731 is surrounded by a mature forest of spruce and fir trees. The lake is located in a valley between mountains located immediately to the east and west of the lake. To the north and south, the land falls away slowly down gently rolling hills. Lake 8731 is situated within the Spruce - Willow - Birch biogeoclimatic zone.

LAKE: Unnamed Lake (Lake 8731)

ACCESS

Directions:

From the junction of Highway 97 and Highway 39, drive south on Highway 97 for approximately 1.5 km and turn right on to the Finlay Forest Service Road. Travel north for approximately 200 km to Mesilinka Camp, then continue on the Finlay-Chunamon Forest Service Road for approximately 105 km to the Ingenika Arm of Williston Reservoir. A barge must be taken across the Ingenika Arm. On the north side of the Ingenika Arm, drive north on the Finlay Forest Service Road for approximately 72.5 km. Turn left, and proceed for approximately 3.7 km to Buffalo Head Camp (Finbow Camp). . The total distance from the junction of Highway 97 and Highway 39 to Buffalo Head Camp is approximately 382.7 km. Lake 8731 is approximately a 31.5 km helicopter ride to the northwest of Buffalo Head Camp.

Barge transportation can be arranged with Finlay Navigation Inc. who can be reached in Prince George at (250) 964-3525 and in Mackenzie at (250) 997-3525. The barge transportation takes approximately 20 minutes and can cost up to $200 one way. Actual barge pick-up times may vary greatly from the predicted pick-up time.

Road Type and Conditions:

Highway 97 is a well-maintained, two-lane paved highway. The Finlay Forest Service Road, on both sides of the Ingenika Arm, and the Finlay-Chunamon Forest Service Road from 0 km to approximately 79 km (Factor Ross Creek), are well-maintained, two-lane gravel logging roads that can be easily traveled with a two-wheel drive truck. After approximately 79 km, the Finlay-Chunamon Forest Service Road becomes quite narrow and very windy. The road in to Buffalo Head Camp from the Finlay Forest Service Road is a well-maintained, two-lane gravel road.

Restrictions:

Although there are no restrictions, it is recommended that a truck radio be used when traveling on all gravel roads.

LAKE: Unnamed Lake (Lake 8731)

RESORTS AND CAMPSITES

There are no resorts or campsites on Lake 8731.

OTHER DEVELOPMENTS

None noted.

OBSTRUCTIONS AND POLLUTIONS

None noted.

SPECIAL RESTRICTIONS

None known.

AQUATIC PLANTS

The following aquatic plants were identified during the time of the survey:

Chara sp.
aquatic moss
marestail (Hippuris sp.)

WILDLIFE OBSERVATIONS

The following wildlife or signs were seen during the time of the survey:

cow moose
mallard duck hen
2 pacific loons

MISCELLANEOUS COMMENTS

1) The north and south ends of Lake 8731 are very shallow and can be hazardous to boaters.

2) Bathymetric map: The lake outline was drawn from an enlargement of air photo 30 BC 87074: No. 101, flown August 25, 1987.

LAKE: Unnamed Lake (Lake 8731)

LAKE DRAINAGE

General:

Lake 8731 is fed by three inlets and two intermittent inlets. The outlet drains the lake from the south end, and flows for approximately 4.4 km to join Del Creek. Del Creek runs for approximately 34.2 km to it's confluence with the Finlay River.

Major Systems:

There are no major systems.

Minor Systems:

Inlet # 1 - Unnamed Creek

Inlet # 1 enters Lake 8731 in the north end of the lake (Plate # 6). Over the first 20 m upstream of the lake, the creek flows through a marshy area of sedge grasses, Equisetum and willows, and has an average wetted width of 0.4 m and depth of 0.15 m. The substrate is composed of silts and organics. Approximately 25 m upstream of the lake, the creek goes underground, turns 90° to the right (looking upstream), then resurfaces and flows down a steep slope over steps created by large woody debris that has fallen into the channel. Approximately 50 m upstream of Lake 8731, the creek goes permanently underground. Inlet # 1 had no fisheries potential during the survey period.

Approximately 25 m upstream of Lake 8731, a channel breaks off from the main creek and flows north away from the lake. This creek flows underground in a few spots. The substrate is composed of silts and organics. During times of high water, Inlet # 1 may back up and the lake may be partially drained down this channel.

Inlet # 2 - Unnamed Creek

Inlet # 2 enters Lake 8731 on the northwest side of the lake near Inlet # 1 through five channels (Plate # 7). Approximately 18 m upstream of the lake, the channels converge into one. The creek flows down a very steep slope (gradient of 30%) over a shale bed. The channel appears to have been created by a wash out down the hill from a previous year. The creek has an average wetted width of 1.0 m and a maximum depth of 0.03 m. Inlet # 2 had no fisheries potential during the survey period.

LAKE: Unnamed Lake (Lake 8731)

Inlet # 3 - Unnamed Creek

Inlet # 3 enters Lake 8731 on the northeast side of the lake. The creek has an average wetted width of 0.25 m and depth of 0.05 m, and flows over a moss bed. Inlet # 3 had no fisheries potential during the survey period.

Outlet - Unnamed Creek

The outlet drains Lake 8731 from the southeast corner of the lake. Approximately 15 m downstream of the lake, there is a 0.8 m high beaver dam that was probably not passable to upstream fish movement at the time of the survey due to lack of sufficient flow over the top of the dam (Plate # 8). Approximately 30 m downstream of the lake, there is a second beaver dam that is 0.4 m high. Approximately 42 m downstream of the lake, there are three small beaver dams that have a total height of 0.4 m and form a series of cascades. Downstream of this point, there are eight more beaver dams that range in height from 0.2 m to 0.9 m. All of these dams are probably passable to upstream fish movement. Downstream of the sixth beaver dam, there is some good salmonid spawning substrate. Below these dams, numerous pieces of large woody debris have fallen into the channel to create small falls approximately 0.15 m in height.

A Stream Survey card was completed for a sample site located approximately 200 m downstream of Lake 8731 (Plates # 9 & # 10). The average wetted width is 1.0 m and the maximum riffle depth is 0.2 m. The substrate is composed of gravels (50%) and fines (50%). The creek morphology is comprised of riffles (40%), pools (35%) and runs (25%) with a gradient of 5%. The water temperature at the time of the survey was 10 °C. For additional information, refer to Appendix B.

Approximately 25 m downstream of Lake 8731, another creek entered the outlet from the east (Plate # 11). A Stream Survey card was completed for a sample site located approximately 100 m upstream of the outlet (Plates # 12 & # 13). The creek has an average wetted width of 1.0 m and a maximum depth of 0.15 m. The substrate is composed of gravels (65%), fines (25%) and small cobble (10%). The creek morphology is mainly riffles (80%) with some pools and runs (10% each), and has a gradient of 8%. The water temperature at the time of the survey was 5.5 °C. For additional information refer to Appendix B.

LAKE: Unnamed Lake (Lake 8731)

FISHERIES MANAGEMENT COMMENTS

Lake 8731 appeared to be barren of all fish species. No fish were caught in four Gee minnow traps or in one experimental monofilament gill net set for 6.5 hrs. There was some salmonid spawning habitat found in the outlet creek; however, fish access from the locations that contained spawning habitat back into the lake is highly questionable. At the time of the survey, there did appear to be some food items suitable for salmonids, such as leeches and dragonfly nymphs. Lake 8731 is a deep lake at 18.5 m, and the summer temperature / oxygen profile indicates that the dissolved oxygen levels at the time of the survey were sufficient to support a fish population. The pH, which averaged 8.05 (lab results), is also suitable for the survival of salmonids. Lake 8731 could be stocked to create a sport fisheries; however, it may need to be continuously stocked and there is no road access to anywhere close enough to the lake to make it easy to walk in to it. If the lake was stocked, a non-breeding population of rainbow trout could be used, such as triploid all-female Pennask rainbow trout, or rainbow trout could be transplanted from either Del Creek or the Finlay River so as not to artificially introduce new genes into the present rainbow trout populations located downstream of the lake. If access was pushed into the lake, there is a suitable location for a Forest Recreation Site located at the south end of the lake near the outlet creek.

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

None known.

Other Related Studies:

None known.

LAKE: Unnamed Lake (Lake 8731)

WATER CHEMISTRY SUMMARY **Limnology Station No. 1**

Field Conditions:

Date:	August 11, 1996		
Time:	1240 hrs	Air Temperature:	16.0 °C
Wind Velocity:	10 - 15 km/h	Wind Direction:	from the SE
Cloud Cover:	9 / 10 o.c.	Surface Conditions:	small waves
Secchi Disc:	9.95 m	Water Colour:	clear with light green tinge

Method Used:

Dissolved Oxygen:	YSI Model 57 Oxygen / Temperature Meter
Water Temperature:	YSI Model 57 Oxygen / Temperature Meter
Air Temperature:	Hand-Held Alcohol Thermometer
pH (field):	Digital pH Pocket Tester
HAS (field):	Hach H2S Field Test Kit
Laboratory Used:	Pacific Environmental Science Center
Water Sampler:	Vertical Alpha Water Bottle (Vandorn)
Metal Sampler:	By Hand; Preserved With 2.0 mL Nitric Acid
Substrate Sampler:	Substrate Sample Not Taken

Water Sample Chemistry: **SEAM Site No.:** E 223141

	Sampling Depths	
	Surface (0.5 m)	Lower (17.5 m)
Alkalinity (lab)	177 mg / L	207 mg / L
Filterable Residue 105°C (lab)	200 mg / L	240 mg / L
H2S (field)	N / A	0.0 mg / L
Nitrogen - Total (lab)	0.23 mg / L	0.34 mg / L
Non-Filterable Residue (lab)	< 5 mg / L	< 5 mg / L
pH (field)	8.0	7.8
pH (lab)	8.32	7.84
Phosphorus - Total Dissolved (lab)	0.004 mg / L	0.009 mg / L
Specific Conductance (lab)	323 µS / cm	375 µS / cm

Bottom Depth: 18.5 m

Substrate Sample Depth: N/A

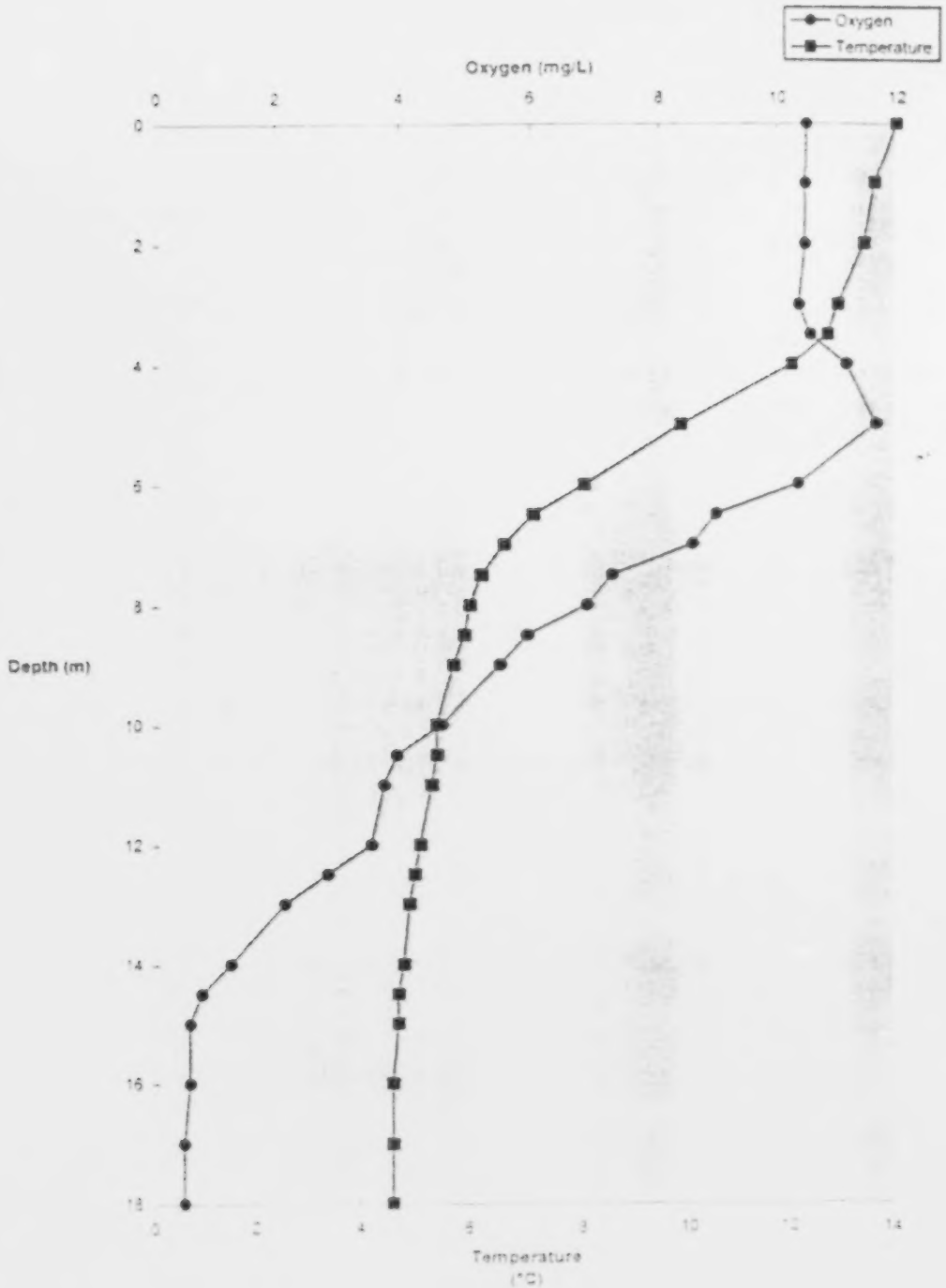
* additional analyzed parameters and results, including metals, are found in Appendix 1

LAKE: Unnamed Lake (Lake 8731)

SUMMER OXYGEN / TEMPERATURE DATA

DEPTH (m)	02 (mg / L)	TEMPERATURE (°C)
Surface	10.5	14.0
1.0	10.5	13.6
2.0	10.5	13.4
3.0	10.4	12.9
3.5	10.6	12.7
4.0	11.2	12.0
5.0	11.7	9.8
6.0	10.4	8.0
6.5	9.0	7.1
7.0	8.6	6.6
7.5	7.3	6.2
8.0	6.9	6.0
8.5	6.0	5.9
9.0	5.6	5.7
10.0	4.7	5.4
10.5	4.0	5.4
11.0	3.8	5.3
12.0	3.6	5.1
12.5	2.9	5.0
13.0	2.2	4.9
14.0	1.3	4.8
14.5	0.8	4.7
15.0	0.6	4.7
16.0	0.6	4.6
17.0	0.5	4.6
18.0	0.5	4.6
18.5	Bottom	

SUMMER OXYGEN / TEMPERATURE PROFILE



LAKE: Unnamed Lake (Lake 8731)

NETTING RECORD

Mesh Size Experimental Order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE # 1

Type:	Sinking Monofilament Gill Net			
Date Set:	August 11, 1996		Time:	0937 hrs
Date Lifted:	August 11, 1996		Time:	1357 hrs
Net Dimensions:	Length:	91.4 *m*	*Depth:*	2.4 m
Shallow End Mesh Size:	25 mm		Depth:	2.Om
			Substrate:	fines / organics and Chara sp.
Deep End Mesh Size:	64 mm		Depth:	12.0 m
			Substrate:	silts / organics

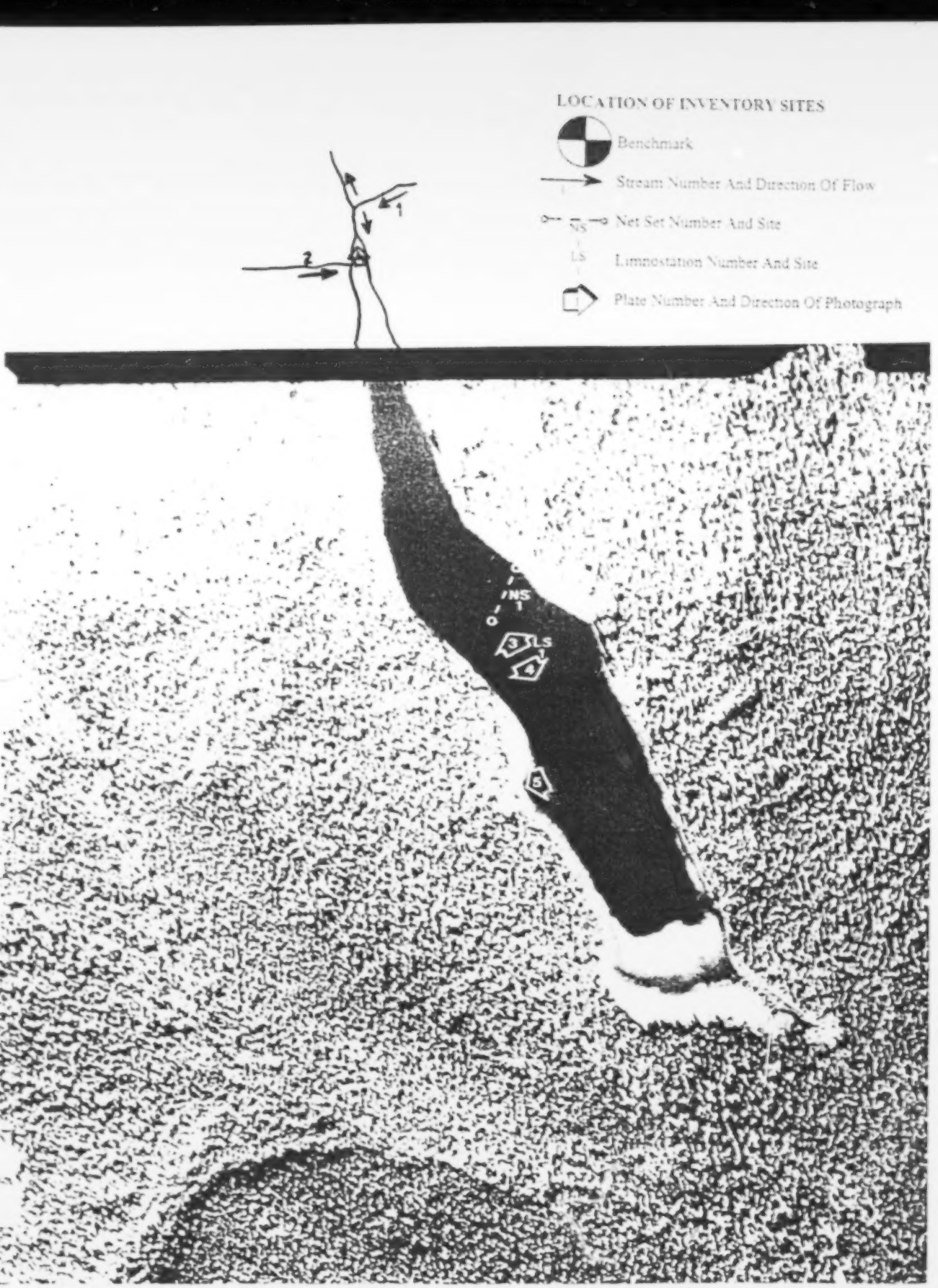
Comments: The net started approximately 4.0 m from the shore. The net was empty.

LAKE CATCH SUMMARY

Minnow Traps:

Bait: Sardines

Trap No.	Hours	Depth (m)	Substrate	Species	No. Caught	Size Range (cm)
1	4:10	0.7	aquatic moss over fines	empty	0	-
2	4:09	1.1	Chara sp. over fines & woody debris	empty	0	-
3	4:08	0.6	aquatic moss over fines	empty	0	-
4	4:09	0.7	aquatic moss over fines	empty	0	-


LOCATION OF INVENTORY SITES
Benchmark
Stream Number And Direction Of Flow
NS Net Set Number And Site
LS Limnostation Number And Site
Plate Number And Direction Of Photograph
1
2
INS 1
3
LS 1
4
5

LAKE: Unnamed Lake (Lake 8731)

PHOTOGRAPH DIRECTORY

Plate	Roll : Number	Description
1	15: 23	Aerial view of Unnamed Lake (Lake 8731) looking north.
2	15: 22	Aerial view of Unnamed Lake (Lake 8731) looking south.
3	15:12 - 13	Panoramic view of Unnamed Lake (Lake 8731) looking northwest from the center of the lake.
4	15: 10 - 11	Panoramic view of Unnamed Lake (Lake 8731) looking southeast from the center of the lake.
5	15: 8	View of the benchmark located 2.0 m above present water level in a 21 cm diameter spruce tree that is 1.8 m from the present water's edge and located on the northeast shore of the lake approximately 350 m from the outlet.
6	15: 19	View of the mouth of Inlet # 1 where it enters Unnamed Lake (Lake 8731) in the north end of the lake.
7	15: 18	View of the mouth of Inlet # 2 where it enters Unnamed Lake (Lake 8731) on the northwest side of the lake near Inlet # 1.
8	15: 14	Upstream view beaver dam # 1 on the outlet, located approximately 15 m downstream of Unnamed Lake (Lake 8731).
9	16: 23	Upstream view of the sample site on the outlet, taken approximately 210 m downstream of Unnamed Lake (Lake 8731).
10	16: 24	Downstream view of the sample site on the outlet, taken approximately 190 m downstream of Unnamed Lake (Lake 8731).
11	15: 15	Upstream view of the confluence point of the outlet and the Inlet Creek, located approximately 25 m downstream of Unnamed Lake (Lake 8731).
12	15: 17	Upstream view of the sample site on the Inlet Creek to the outlet, taken approximately 90 m upstream of the outlet.
13	15: 16	Downstream view of the sample site on the Inlet Creek to the outlet, taken approximately 105 m upstream of the outlet.

LAKE: Unnamed Lake (Lake 8731)

Plate # 1: Aerial view of Unnamed Lake (Lake 8731) looking north.

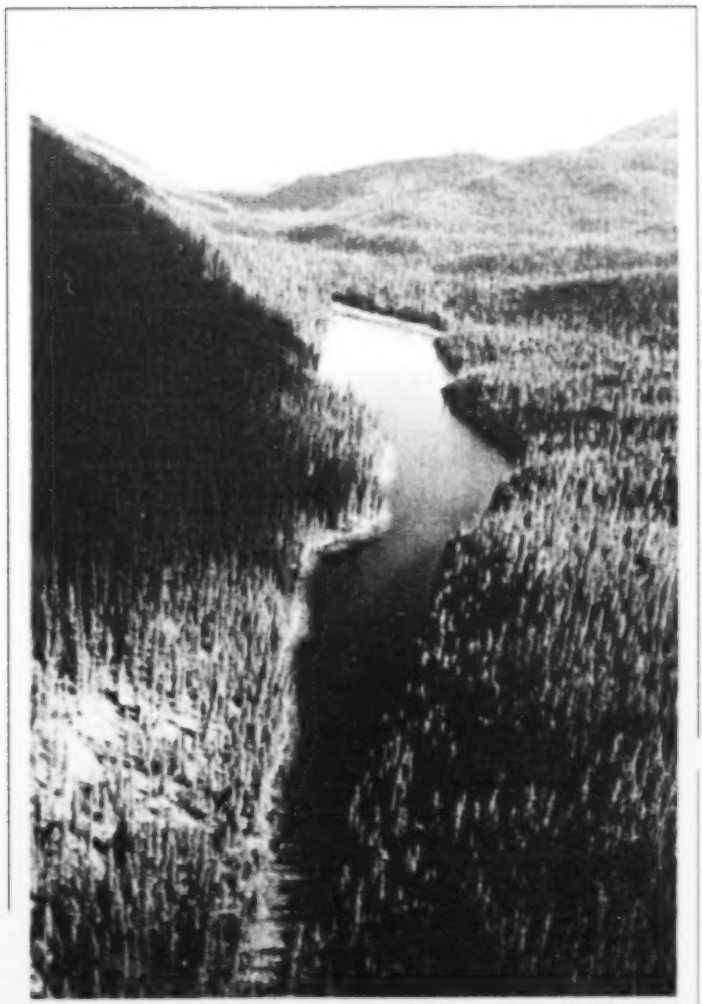


Plate 4 2: Aerial view of Unnamed Lake (Lake 8731) looking south.

LAKE: Unnamed Lake (Lake 8731)

Plate # 3: Panoramic view of Unnamed Lake (Lake 8731) looking northwest from the center of the lake.

LAKE: Unnamed Lake (Lake 8731)

Plate # 4: Panoramic view of Unnamed Lake (Lake 8731) looking southeast from the center of the lake.

LAKE: Unnamed Lake (Lake 8731)

Plate # 5: View of the benchmark located 2.0 m above present water level in a 21 cut diameter spruce tree that is 1.8 m from the present water's edge and located on the northeast shore of the lake approximately 350 m from the Outlet Creek.

Plate # 6: View of the mouth of Inlet # 1 where it enters Unnamed Lake (Lake 8731) in the north end of the lake.

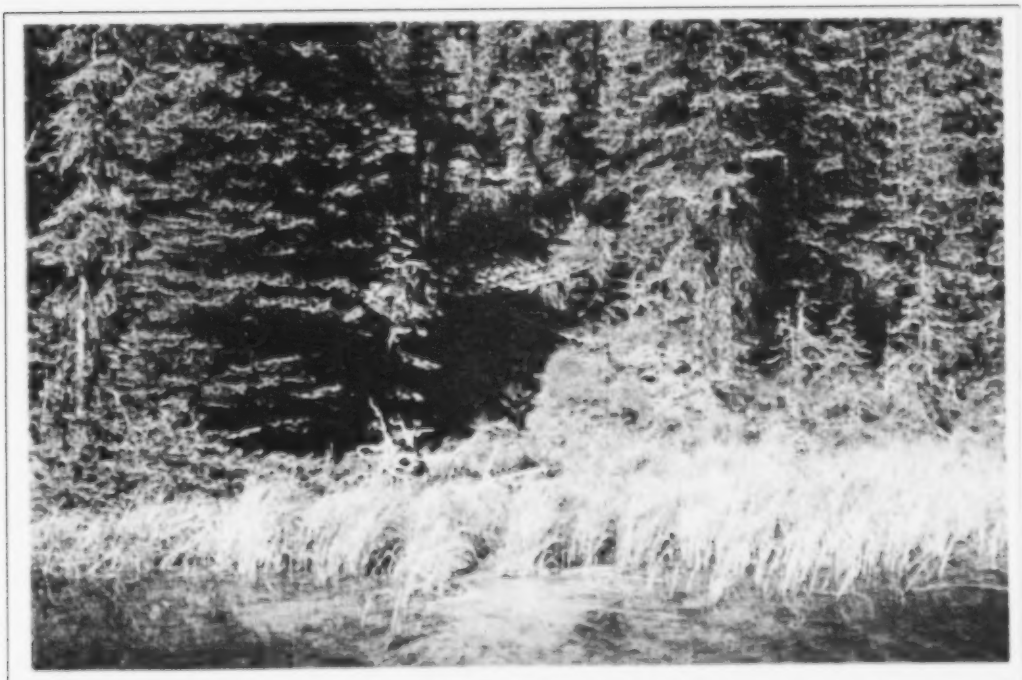


Plate # 7: View of the mouth of Inlet # 2 where it enters Unnamed Lake (Lake 8731) on the northwest side of the lake near Inlet # 1.

LAKE: Unnamed Lake (Lake 8731)

Plate # 8: Upstream view of beaver dam # 1 on the Outlet Creek, located approximately 15 m downstream of Unnamed Lake (Lake 8731).

Plate # 9: Upstream view of the sample site on the outlet, taken approximately 210 m downstream of Unnamed Lake (Lake 8731).

LAKE: Unnamed Lake (Lake 8731)

Plate # 10: Downstream view of the sample site on the outlet, taken approximately 190 m downstream of Unnamed Lake (Lake 8731).

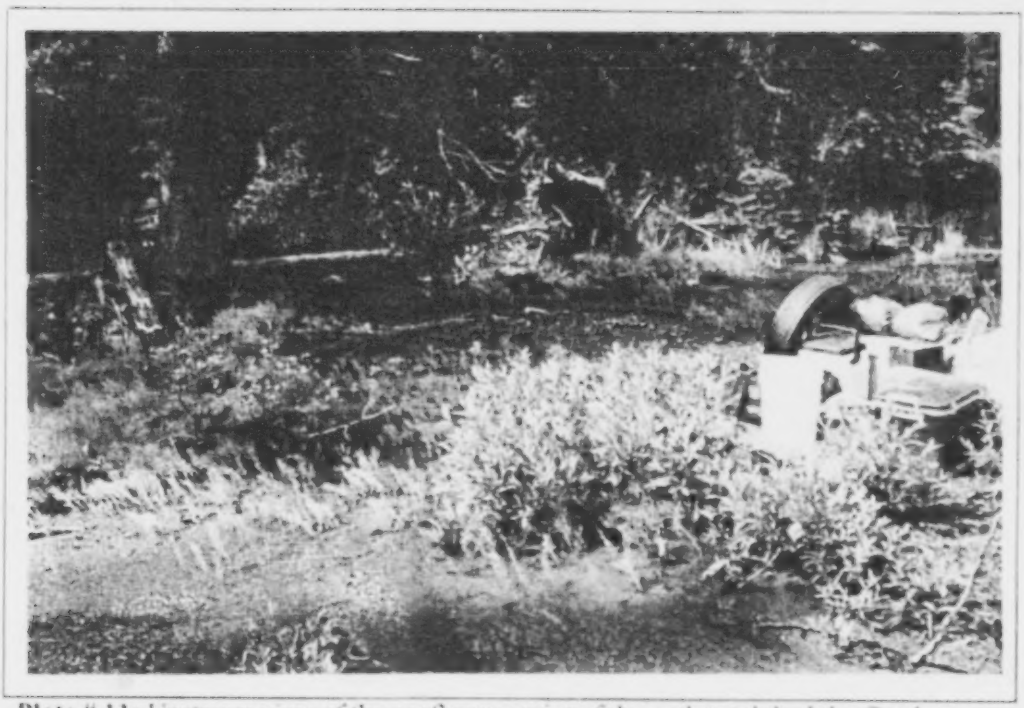


Plate # 11: Upstream view of the confluence point of the outlet and the Inlet Creek, located approximately 25 m downstream of Unnamed Lake (Lake 8731).

Plate # 12: Upstream view of the sample site on the Inlet Creek to the outlet, taken approximately 90 m upstream of the outlet.

Plate # 13: Downstream view of the sample site on the Inlet Creek to the outlet, taken approximately 105 m upstream of the outlet.

Appendix A

LABORATORY REPORT

Water Chemistry Analysis

RESULTS FOR UNNAMED LAKE-LAKE 8731 SAMPLES

Parameter Analyzed		Units	963803-001	963803-002
ALKALINITY		mg/l	177	207
CONDUCTIVITY		uS/cm	323	375
METALS/TOTAL (WATER-ICP)	AG	mg/l	<.01	-
	AL	mg/l	<.06	-
	AS	mg/l	<.06	-
	B	mg/l	<.01	-
	BA	mg/l	.022	-
	BE	mg/l	<.001	-
	CA	mg/l	42.7	-
	CD	mg/l	<.006	-
	CO	mg/l	<.006	-
	CR	mg/l	.013	-
	CU	mg/l	<.006	-
	FE	mg/l	.027	-
	K	mg/l	.5	-
	MG	mg/l	19	-
	MN	mg/l	.003	-
	MO	mg/l	<.01	-
	NA	mg/l	.7	-
	NI	mg/l	<.02	-
	P	mg/l	<.1	-
	PB	mg/l	<.06	-
	SB	mg/l	<.06	-
	SE	mg/l	<.06	-
	SI	mg/l	1.49	-
	SN	mg/l	<.06	-
	SR	mg/l	.15	-
	TI	mg/l	<.002	-
	V	mg/l	<.01	-
	ZN	mg/l	<.002	-
NITROGEN/AMMONIA		mg/l	.014	.013
/NITRITE		mg/l	<.002	<.002
/NITRITE+NITRATE		mg/l	<.002	.068
/TOTAL		mg/l	.23	.34
PH		Rel.U.	8.32	7.84
PHOSPHORUS/O-PO4		mg/l	<.001	.005
/TOTAL		mg/l	.003	.031
/TOTAL DISSOLVED		mg/l	.004	.009
RESIDUE/FILTERABLE		mg/l	200	240
/NON-FILTERABLE		mg/l	<5	<5
BC CLIENT STUDY CODE			20	20
SAMPLING AGENCY			91	91
SITE IDENTIFIER/NUMBER			E223141	E223141
COLLECTION START DATE		y/m/d	96/08/11	96/08/11
UPPER DEPTH		METERS	0.5	17.5
TEMPERATURE ON ARRIVAL		deg.C	9	9

Appendix B

Tributary Stream Data

D.F.O. / M.O.E. Stream Survey Form

DFO / MOE

STREAM SURVEY FORM

| | | |

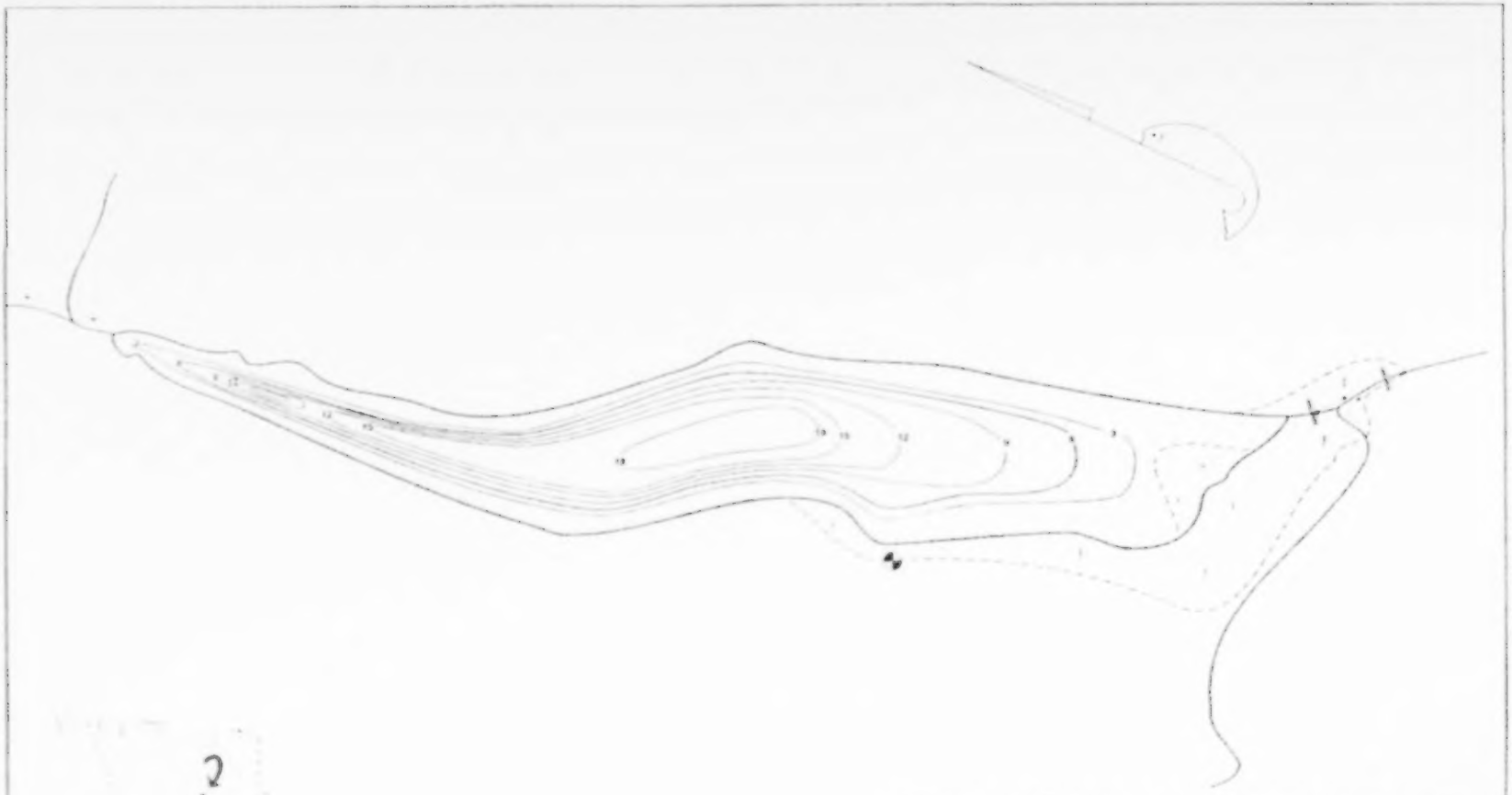
DFO / MOE

STREAM SURVEY FORM

| | | |

Appendix C

BATHYMETRIC MAP



Reduced to

34%

of Original Size

STATISTICS AT TIME OF SURVEY

Unnamed Lake 8731